ABSTRACT

The present invention describes a 5' nuclease real-time polymerase chain reaction (PCR) approach for the quantification of total coliforms, *E. coli*, toxigenic *E. coli* O157:H7, toxigenic *M. aeruginosa* (microcystin hepatotoxins), *Giardia lamblia*, and *Cryptosporidium parvum*, based on the specific identified primer and probe sequences from the *lacZ (E. coli)*, *eaeA (E. coli* O157:H7), *mcyA (M. aeruginosa)*, *β-giardin (G. lamblia)*, and COWP *(C. parvum)* genes respectively. The invention allows for the detection of all of the aforementioned microbes, with or without culture enrichments, utilizing a 5' nuclease PCR approach. The invention also provides primer and probe sequences useful to produce detectable amplicons, by any amplification method, which are diagnostic for such organisms.